In the Claims:

Claims 1 and 6 are amended herein. Claims 4, 5, 8, 9 and 11 are canceled. New claims 12-16 are added. The remaining claims are not amended in this response.

1. (currently amended) An apparatus for precise distance measurement, comprising:

a multiple frequency generator that generates a base signal, an interim signal and a transmission signal;

a laser transmitter connected to the multiple frequency generator to output a light signal with the transmission signal to a target;

an optical receiver that receives the light signal from the laser transmitter reflected by a target and outputs a measurement signal; wherein the optical receiver is connected to the multiple frequency generator and mixes the base signal and the reflected light signal to output a measurement signal;

a first measuring unit connected to the multiple frequency generator and the optical receiver obtains a time difference by calculating a time difference between the measurement signal and the transmission signal;

a second measuring unit connected between the multiple frequency generator and the optical receiver to calculate a phase

difference by comparing the measurement signal and the interim signal, wherein the second measuring unit comprises:

a signal corrector connected to the optical receiver to modify the measurement signal's wave form and generate a modified measurement signal, wherein the signal corrector comprises a band-pass filter connected to the optical receiver and a wave form shaper connected to the band-pass filter and the phase comparator;

a phase comparator connected to the wave form shaper of the signal corrector and the multiple frequency generator to calculate the phase difference between the interim signal and the modified measurement signal; and

a central processing unit connected to the first and second measuring units to calculate a distance between the laser transmitter and a target by the time difference and the phase difference

2. (original) The apparatus as claimed in claim 1, wherein the multiple frequency generator comprises:

an oscillator that generates the base signal;

a frequency divider connected to the oscillator, wherein the frequency divider divides the base signal to the interim signal; and

a frequency synthesizer connected to the frequency divider to generate the transmission signal.

3. (original) The apparatus as claimed in claim 1, wherein the first measuring unit comprises:

a square wave generator connected to the optical receiver and the multiple frequency generator to generate a square wave signal; and

a wave width measuring unit connected to the square wave generator and the multiple frequency generator to calculate a wave width of the square wave signal.

4. (canceled)

5. (canceled)

6. (currently amended) The apparatus as claimed in claim [[4]] 1, wherein the phase comparator comprises:

a first mixer connected to the optical receiver and the multiple frequency generator mixed the measurement signal and the interim signal;

a first low pass filter connected to the first mixer to output a first DC value;

a phase locked loop (PLL) connected to multiple frequency generator to generate a delay interim signal with a $\pi/2$ phase delay;

a second mixer connected between the PLL and the optical receiver to mix the delay interim signal and the measurement signal;

a second low pass filter connected to the second mixer to output a second DC value; and

a logic element connected to the first and second low pass filters to calculate the phase difference by dividing the first and second DC values.

7. (canceled)

8. (canceled)

9. (canceled)

10. (original) The apparatus as claimed in claim 6, wherein the signal corrector is composed of a band-pass filter connected to the optical receiver and a wave form shaper connected to the band-pass filter and the phase comparator.

11. (canceled)

12. (new) An apparatus for precise distance measurement, comprising:

a multiple frequency generator that generates a base signal, an interim signal and a transmission signal;

a laser transmitter connected to the multiple frequency generator to output a light signal with the transmission signal to a target;

an optical receiver that receives the light signal from the laser transmitter reflected by a target and outputs a measurement

signal; wherein the optical receiver is connected to the multiple frequency generator and mixes the base signal and the reflected light signal to output a measurement signal;

a first measuring unit connected to the multiple frequency generator and the optical receiver obtains a time difference by calculating a time difference between the measurement signal and the transmission signal;

a second measuring unit connected between the multiple frequency generator and the optical receiver to calculate a phase difference by comparing the measurement signal and the interim signal, wherein the second measuring unit comprises:

a signal corrector connected to the optical receiver to modify the measurement signal, wherein the signal corrector comprises a band-pass filter connected to the optical receiver and a wave form shaper connected to the band-pass filter;

a mixer connected to the multiple frequency generator to mix the transmission signals to generate a reference signal; and

a phase comparator connected to the wave form shaper of the signal corrector and the mixer to calculate the phase difference between the reference signal and the measurement signal; and

a central processing unit connected to the first and second measuring units to calculate a distance between the laser transmitter and a target by the time difference and the phase difference.

13. (new) The apparatus as claimed in claim 12, wherein the multiple frequency generator comprises:

an oscillator that generates the base signal;

a frequency divider connected to the oscillator, wherein the frequency divider divides the base signal to the interim signal; and

a frequency synthesizer connected to the frequency divider to generate the transmission signal.

14. (new) The apparatus as claimed in claim 12, wherein the first measuring unlit comprises:

a square wave generator connected to the optical receiver and the multiple frequency generator to generate a square wave signal; and

a wave width measuring unit connected to the square wave generator and the multiple frequency generator to calculate a wave width of the square wave signal.

15. (new) The apparatus as claimed in claim 12, wherein the phase comparator comprises:

a first mixer connected to the optical receiver and the multiple frequency generator mixed the measurement signal and the interim signal;

a first low pass filter connected to the first mixer to output a first DC value;

a phase locked loop (PLL) connected to multiple frequency generator to generate a delay interim signal with a $\pi/2$ phase delay;

a second mixer connected between the PLL and the optical receiver to mix the delay interim signal and the measurement signal;

a second low pass filter connected to the second mixer to output a second DC value; and

a logic element connected to the first and second low pass filters to calculate the phase difference by dividing the first and second DC values.

16. (new) The apparatus as claimed in claim 15, wherein the signal corrector is composed of a band-pass filter connected to the optical receiver and a wave form shaper connected to the band-pass filter and the phase comparator.